REMARKS

This Amendment is filed in response to the Office Action mailed on February 16, 2007. All objections and rejections are respectfully traversed.

Claims 6-9, 11-17, 19-20, and 23-54 are currently pending.

Claim 54 is added.

Request for Interview

The Applicant respectfully requests a telephonic interview with the Examiner after the Examiner has had an opportunity to consider this Amendment, but before the issuance of the next Office Action. The Applicant may be reached at 617-951-3067.

Claim Rejections – 35 USC §103

At paragraph 12 of the Office Action, claims 28-41, 44-50, and 52 were rejected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Talagala et al., US Patent No. 6,732,289, hereinafter Talagala.

The present invention, as set forth in representative claim 28, comprises in part:

28. A method for a network device to manage ownership of one or more storage devices in a network storage system, comprising:
     reading ownership information from a predetermined area of each storage device;
     in response to reading the ownership information, creating an ownership table that identifies the one or more storage devices owned by the network device;

reading a small computer system interface reservation tag from each storage device;

comparing the SCSI reservation tag to the ownership informa-tion of the same storage device and, if there is not a match, changing the reservation tag to match the ownership information; and

configuring the one or more storage devices identified in the own-ership table into at least one volume for use by the network device.

By way of background, Brunelle discloses a way of using standard small com-puter system interface (SCSI) persistent reservations with I/O barriers. The American National Standards Institute (ANSI) has standardized a number of SCSI Persistent Reser-vation commands, such as *Persistent Reserve Out*. *See* col. 1, lines 28-41. Brunelle de-scribes issuing two of these commands to assign ownership to storage devices. *See* col. 5, lines 60-67. The first *Persistent Reserve Out* command includes a key describing a particular node owning the device. *See* col. 6, lines 38-48. The second *Persistent Re-serve Out* command includes a parameter specifying an access type, such as "write exclu-sive read only." *See* col. 5, lines 65-67 and col. 6, lines 48-54. Additionally, Brunelle describes writing registration information each time a node is initialized or changed.

Talagala discloses a fault tolerant system to transfer control from one storage con-troller to another storage controller. In communication with the storage controllers and one or more disk drives are failover managers (also known as failover software tasks "FST"). The FST (failover manager) receives a request from a storage controller. The request may be a request for ownership or a request for access. (Col. 4, lines 37-39). When a request for ownership is received, the FST will not make any decision with re-gard to which controller will own which disk drive, rather the FST will grant ownership to any storage controller that asks for ownership. (Col. 4, lines 42-49). When a request

for access is received, the FST determines whether the requesting storage controller has ownership by reading a storage controller ID and comparing that to a current owner identified in memory. (Col. 5, lines 5-13). If the storage controller ID and current owner are the same, then the requesting storage controller is granted access. (Col. 5, lines 13-16). However, if the storage controller ID and the current owner are different, then the FST will deny access to the requesting storage controller. (Col 5, lines 17-19).

Applicant respectfully urges that Brunelle and Talagala, taken alone or in combination, do not teach or suggest Applicant's claim novel step of *comparing the SCSI reservation tag to the ownership information of the same storage device and, if there is not a match, changing the SCSI reservation tag to match the ownership information*. In further detail, Applicant's claimed invention uses two part ownership identification method. The first part of this ownership method is writing of ownership information to a predetermined area of each disk. Within the system, this ownership information acts as the definitive ownership attribute. This predetermined area of the disk can be any known and constant location on each of the disks. The second part of the ownership method is setting of a SCSI reservation to allow only the disk owner to write to the disk. This use of a SCSI reservation allows other servers to read the ownership information from the disks. Additionally, the ability to change the SCSI reservation tag to match the ownership information stored in the predetermined area of disk allows a storage server to configure the disks into the appropriate RAID groups and or volumes. The ownership information stored on the storage device (sector S) is the controlling ownership information on the disk. When a mismatch occurs between the ownership information stored in the predetermined sector and the SCSI reservation, the SCSI reservation is changed to show the same owner that is in the predetermined sector of the disk.

The Examiner states that Brunelle discloses "a storage device processing a write command received from a cluster node and the reservation table indicates that here are no current reservations." The Examiner cites Brunelle, Col. 7, lines 32-45 to support this statement, which states:

> "The storage device 104 processes a write command received from a cluster node 102a, 102b if the persistent reservation table 500 indicates that there are no current persistent reservations. The shared storage device 104 searches the persistent reservation table 500. If the storage device 104 finds a reservation entry 502 in the persistent reservation table 500 for the initiator identifier 512 from which the write command was received, the write command is processed. However, if there is no reservation entry 502 for the initiator identifier 512 and there is a reservation descriptor 514 with the reservation type field 506 set to "write exclusive registrants only," a non-registered storage network controller 112 cannot write to the storage device 104"

In reference to the above statements, Brunelle discloses not allowing write access to a non-registered address. In contrast, Applicant's invention is changing the SCSI reservation to the same ownership as the network ownership stored in the predetermined location. The SCSI reservations and disk ownerships of a single network device at times may not match up. Applicant's invention uses the ownership information stored on disk as the definite ownership, and changes the SCSI reservation tag to the same ownership as stored in the predetermined sector. There is no suggestion in Brunelle of correcting the SCSI tag with ownership information stored at the predetermined sector, as claimed by Applicant.

The Examiner further states that Talagala shows a comparison was done at Col. 5, limes 5-20, which state:

> "On the other hand, if the request from the storage controller is a disk access request (block 405, disk access), the FST proceeds to a deci-

sion block 430 where it determines whether the requesting storage control-
ler currently has ownership of the disk drive it wants to access. In one em-
bodiment, the verification of the ownership is accomplished by reading a
storage controller identification number (e.g., SCSI ID) and comparing it
to a current owner identifier data previously stored in a memory. If the
FST determines that the requesting storage controller has current owner-
ship of the disk drive (block 430, yes), it will grant access to the disk drive
by passing the access request to the disk drive. Otherwise, if the requesting
storage controller does not have current ownership (block 430, no), the
FST will block the access to the disk drive by aborting the request. In
block 440, the FST updates its list of recent disk access requests that have
been committed to the disk drive."

In reference to the statement above, Talagala discloses comparing an ID of a re-

questing device with current stored ownership information to determine if the requesting

device may access the disk. In contrast, in Applicant's invention, after a network device

determines which disk it owns by reading the predetermined sector of each disk, then the

network device determines if network device's SCSI reservation tags match ownership

information in the predetermined area. If they do not match, then the network device

modifies the SCSI reservation tag to show the same ownership as in the predetermined

sector. There is no suggestion in Talagala of correcting ownership information as

claimed by Applicant because Talagala allows a device to claim ownership without com-

paring to ownership already on disk. Talagala merely discloses replacing ownership in-

formation. (Col. 4, lines 42-49). There is no suggestion in Talagala of using a two part

ownership system and matching the SCSI reservation to the ownership information stored

in the predetermined sector if they do not match, as claimed by Applicant.

Accordingly, Applicant respectfully urges that the combination of Brunelle and

Talagala is legally insufficient to make obvious the present claims under 35 U.S.C. §103

because of the absence of the Applicant's claimed novel *comparing the SCSI reservation*

tag to the ownership information of the same storage device and, if there is not a

match, changing the SCSI level 3 persistent reservation tag to match the ownership

information.

At paragraph 10 of the Office Action, claims 9, 11-17, 19-20, and 23-24 were re-

jected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Carlson et

al., US Patent Application Publication No. 2003/0093501, hereinafter Carlson.

The present invention, as set forth in representative claim 9, comprises in part:

9. A network storage system comprising:
    a plurality of network devices;
    one or more switches, each network device connected to at least
one of the one or more switch;
    a plurality of disks having a first ownership attribute written to a
predetermined area of each disk and a second ownership attribute in the
form of a small computer system interface (SCSI) reservation tag, wherein
the first and second ownership attribute are written to each disk, each disk
connected to at least one of the plurality of switches;
    *each network device of the plurality of network devices identifies
all disks owned by that network device using ownership information
written to the predetermined area of each disk of the plurality disks and,
for each identified disk, if a mismatch occurs between the ownership in-
formation on the predetermined area of the disk and the ownership de-
fined by the SCSI reservation tag, then using the ownership information
written to the predetermined area of the disk as definite ownership data.*

By way of background, Carlson discloses a Storage Area Network (SAN) where

storage devices are interconnected by switches to form a fabric. *See* paragraph 0039.

Applicant respectfully urges that Brunelle and Carlson taken alone or in combina-

tion do not teach or suggest Applicant's claimed novel *each network device of the plu-*

rality of network devices identifies all disks owned by that network device using owner-

ship information written to the predetermined area of each disk of the plurality disks

and, for each identified disk, if a mismatch occurs between the ownership information

on the predetermined area of the disk and the ownership defined by the SCSI reserva-

tion tag, then using the ownership information written to the predetermined area of the

disk as definite ownership data.

There is neither disclosure nor suggestion in Brunelle of changing the SCSI reser-
vation tag of a first network device to match the ownership information stored in the pre-
determined sector that identifies the owner as the first network device. Applicant's de-
vice is matching the two part indicia of ownership using the ownership information
stored in the predetermined sector as the definite ownership.

Additionally, Carlson does not disclose nor suggest matching the SCSI reserva-
tion tag of a network device with the ownership information stored in the predetermined
sector identifying the owner as the network device, as claimed by Applicant.

Accordingly, Applicant respectfully urges that the combination of Brunelle and
Carlson is legally insufficient to make obvious the present claims under 35 U.S.C. §103
because of the absence of the Applicant's claimed novel *each network device of the plu-*
rality of network devices identifies all disks owned by that network device using owner-

ship information written to the predetermined area of each disk of the plurality disks

and, for each identified disk, if a mismatch occurs between the ownership information

on the predetermined area of the disk and the ownership defined by the SCSI reserva-

tion tag, then using the ownership information written to the predetermined area of the

disk as definite ownership data.

At paragraph 11, of the Office Action, claims 25-26 were rejected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Carlson, and in further view of Jaskiewicz et al., US Patent Application Publication 2003/0061491, hereinafter Jaskiewicz.

Applicant respectfully notes that claims 25-26 are dependent claims that depend from independent claims which are believed to be in condition for allowance. Accordingly, claims 25-26 are believed to be in condition for allowance.

Claim Rejections - 35 USC § 102

At paragraphs 6-7 of the Office Action, claims 6-8, 27, 42-43, 51, and 53 were rejected under 35 U.S.C. §102 as being anticipated by Brunelle et al., US Patent No. 6,654,902, issued on Nov. 25, 2003, hereinafter Brunelle.

The present invention, as set forth in representative claim 6, comprises in part:

6. A method of claiming ownership of a plurality of disks by a network device in a network storage system, comprising:
    writing ownership information to a predetermined area of each disk;
    setting a small computer system interface (SCSI) reservation tag for each disk to a state of network device ownership to provide a two part indicia of ownership for each disk, where the two part indicia of ownership are both written to each disk;

identifying all disks owned by the network device using owner-ship information written to the predetermined area of each disk of the plurality disks and, for each identified disk, if a mismatch occurs between the ownership information on the predetermined area of the disk and the ownership defined by the SCSI reservation tag, then using the ownership information written to the predetermined area of the disk as definite ownership data.

Applicant respectfully urges that Brunelle does not teach nor disclose Applicant's claimed novel ***identifying all disks owned by the network device using ownership information written to the predetermined area of each disk of the plurality disks and, for each identified disk, if a mismatch occurs between the ownership information on the predetermined area of the disk and the ownership defined by the SCSI reservation tag, then using the ownership information written to the predetermined area of the disk as definite ownership data.***

There is no disclosure in Brunelle of changing the SCSI reservation tag of a first network device to match the ownership information stored in the predetermined sector that identifies the first network device. Applicant's device is matching the two part indicia of ownership using the ownership information stored in the predetermined sector as the definite ownership.

Accordingly, Applicant respectfully urges that Brunelle is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel ***identifying all disks owned by the network device using ownership information written to the predetermined area of each disk of the plurality disks and, for each identified disk, if a mismatch occurs between the ownership information on***

the predetermined area of the disk and the ownership defined by the SCSI reservation

tag, then using the ownership information written to the predetermined area of the disk

as definite ownership data.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

__/shannen c. delaney/_____
Shannen C. Delaney
Reg. No. 51,605
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500